TENNESSEE DEPARTMENT OF AGRICULTURE

Water Resources Program

The following individual has submitted all required elements of an NMP/CNMP as required to obtain a CAFO permit. Their Nutrient Management Plan (or CNMP) has been reviewed and approved by this office.

Name of Owner/Operator: Derek Galey

Operation Name: Bear Creek Farm

Address of Operation: Bear Creek Road, Mckenzie, TN 38201

Phone Number: (731) 514-3839 County: Weakley

Date application was initiated:

RECEIVED
OCT 15 2012

Date approval forwarded to TDEC:

JAN 07 2013

NMP/CNMP Approval Date:

THE APPROVAL SHALL NOT BE CONSTRUED AS CREATING A PRESUMPTION OF CORRECT

JAN 07 2013

OPERATION OR AS WARRANTING THAT THE APPROVED FACILITIES WILL REACH THE DESIGNED GOALS

Date approval received by TDEC

TDA Reviewer's Name: Sam Marshall

TDA Reviewer's Signature: Sam Marshall Jan. 7, 2013
Date

Nutrient Management Plan (NMP) and CAFO Permit Application Checklist for SOPC000000

Facility Name: Bear Creek Farm Form Completed by: Sam Marshall

Name of Owner: Derek Galey

SOPC Requirements*			Citation of Requirements in CNMP/ NMP			
			Completed by producer or TSP		FOR TDA USE ONLY	
Required Element	Permit Page #	Citation	Item Addressed in (C)NMP on Page #	Initials	Comments	Completed (Yes/ No)
Notice of Intent (NOI) form	4	1.6.1	—			✓
Declarations Page, which addresses the following items:			—			✓
Prevents direct contact of confined animals with waters of the State.	8	3.1.e				
Ensures chemicals or other contaminants handled on-site are handled (including spill clean-up) and disposed of properly.	8, 10	3.1.f, 4.6.1.a, 4.6.1.c				
All sampling of soil and manure/litter is conducted according to protocols developed by UT Extension.	8	3.1.h				
A copy of the most recent nutrient management plan (NMP) will be kept as part of the farm records and will be maintained and implemented as written.	9	3.1.j				
If applicable, all waste directed to under-floor waste pits shall be composed entirely of wastewater (i.e., washwater, animal waste).	10	4.6.1.b				
Notify TDEC of any significant wildlife mortalities following land application of animal wastes.	10	4.6.1.d				
Address employee training for proper operation and maintenance of facility where employees are responsible for activites that relate to permit compliance.	10	4.6.1.e				
There shall be no land application of nutrients within 24 hours of a precipitation event that may cause runoff. The operator shall not land apply nutrients to frozen, flooded, or saturated soils.	12	4.6.2.f				

Name of Owner: Derek Galey

SOPC Requirements*			Citation of Requirements in CNMP/ NMP			
			Completed by producer or TSP		FOR TDA USE ONLY	
Required Element	**Permit Page #**	**Citation**	**Item Addressed in (C)NMP on Page #**	**Initials**	**Comments**	**Completed (Yes/ No)**
Topo Map with Property Boundary	7	2.3.1.f	8			✓
Ortho Map with Property Boundary showing location of animal barns/ houses, compost bins, litter storage bins, manure lagoons/ holding ponds, nearby roads, fields to which manure/ litter will be applied, sinkholes, neighboring wells, wetlands, etc.			7			✓
The NMP contains Best Management Practices (BMPs)/ conservation practices necessary to manage production area.	8	3.1.a	9			✓
The NMP contains BMPs used (i.e. buffers) to control runoff of pollutants from land application.	8	3.1.g				NA
Ensures adequate waste storage. For liquid waste systems this would include: documentation of the total volume for solids accumulation, design treatment volume, total design volume, and approximate number of days for storage capacity.	8, 15	3.1.b, 5.2.g	12			✓
Proper Management of Mortalities (also to be identified in Closure Plan).	8, 14	3.1.c, 4.10	10-11 13 16-18			✓
Clean water is diverted from the production area.	8, 11	3.1.d, 4.6.1.f	5			✓
Follow latest UT guidance for appropriate testing methods for manure.	8	3.1.h	33-38			✓
Identify methods used to land apply litter, manure, or process wastewater.	9	3.1.i				NA
Nutrient budget or balance sheet of all nutrients (animal waste, compost, fertilizer, etc.) used on the farm based on current UT crop recommendations which ensures appropriate use of nutrients.	9	3.1.i	26-27 all export			✓

Name of Owner: Derek Gale

SOPC Requirements*			Citation of Requirements in CNMP/ NMP			
			Completed by producer or TSP		FOR TDA USE ONLY	
Required Element	Permit Page #	Citation	Item Addressed in (C)NMP on Page #	Initials	Comments	Completed (Yes/ No)
Expected crop yields	15	5.2.h				NA
NMP addresses facility maintenance.	9	3.2.c	29-30			✓
Closure/rehabilitation plan for waste system storage/treatment structure(s) and mortalities that addresses facility maintenance until proper closure to be completed within 360 days.	5, 13-14	1.6.3, 4.9	42			✓
Includes field specific assessment of potential for N and P2O5 transport from field to surface waters. Must address form, source, amount, timing, and method of application of nutrients on each field to achieve realistic production goals (TN P Index must be provided for each field).	11	4.6.2.a.i				NA
Current manure/litter analysis for N and P_2O_5 (from within last year).	11	4.6.2.b				NA
Provide results of soil test conducted at a minimum of once every five years for all fields receiving manure, litter, or process wastewater.	11	4.6.2.b				NA
Applications of waste are no closer than 100 ft. to any down-gradient surface waters, open tile line intake structures, sinkholes, ag. wells, or other conduits to surface waters unless 100 ft. setback with a 35 ft. wide vegetated buffer is substituted or it is demonstrated that a setback/buffer is not needed due to use of alternate conservation practices or where field conditions would provide equivalent pollutant reductions.	11	4.6.2.d				NA
New CAFOs located adjacent to high quality stream (Exceptional TN waters) leave in place a 60-ft natural riparian buffer between stream and land application area.	12	4.6.2.e				NA

Name of Owner: Derek Goley

SOPC Requirements*			Citation of Requirements in CNMP/ NMP			
			Completed by producer or TSP		FOR TDA USE ONLY	
Required Element	**Permit Page #**	**Citation**	**Item Addressed in (C)NMP on Page #**	**Initials**	**Comments**	**Completed (Yes/ No)**
Liquid Waste Management System Requirements						
Liquid waste management system must be designed to exclude all stormwater and must not contain any design allowances for a discharge.	12	4.7	5 46-49			✓
If liquid waste management system was constructed, modified, repaired, or placed in operation after April 13, 2006, it must meet or exceed NRCS FOTG standards. This should consist of pertinent engineered drawings (i.e. schematic of system) accompanied by a descriptive narrative.	12	4.7	4 & 46-49			✓
Any new or additional confinement buildings, waste containment/ treatment structures constructed after April 13, 2006 shall be located according to NRCS Practice Standard 313.	12	4.7.a	4			✓
If any earthen structures were constructed or modified after April 13, 2006, a subsurface investigation is provided.	12	4.7.b			This does not apply to deep-pit hog barns	NA

Comments:

Tennessee Department of Environment and Conservation,
Division of Water Pollution Control
401 Church Street, 6th Floor L & C Annex, Nashville, TN 37243
(615) 532-0625

CONCENTRATED ANIMAL FEEDING OPERATION (CAFO)
STATE OPERATING PERMIT (SOP)
NOTICE OF INTENT (NOI)

Type of permit you are requesting: ☐ SOPCD0000 (designed to discharge) ☒ SOPC00000 (no discharge) ☐ Unknown, please advise

Application type: ☒ New Permit ☐ Permit Reissuance ☐ Permit Modification

If this NOI is submitted for Permit Modification or Reissuance provide the existing permit tracking number: ____

OPERATION IDENTIFICATION

Operation Name: **Bear Creek Farm**		County:	**Weakley**
Operation Location/ Physical Address: **Bear Creek Road, McKenzie, TN 38201**		Latitude:	**36.11816**
		Longitude:	**-88.65349**
Name and distance to nearest receiving water(s): **950 Feet to Stream that flows to Bear Creek**			
If any other State or Federal Water/Wastewater Permits have been obtained for this site, list those permit numbers:			
Animal Type: ☐ Poultry ☒ Swine ☐ Dairy ☐ Beef ☐ Other ____			
Number of Animals: 4960	Number of Barns: 2	Name of Integrator: Tosh Farms	
Type of Animal Waste Management: (check all that apply)	☐ Dry ☐ Liquid ☒ Liquid, Closed System (i.e. covered tank, under barn pit, etc.)		
Attach the NMP ☒ NMP Attached	Attach the closure plan ☒ Closure Plan Attached	Attach a topographic map ☒ Map Attached	

PERMITTEE IDENTIFICATION

Official Contact (applicant): **Derek Galey**	Title or Position: **Owner/Operator**			
Mailing Address: **208 Stafford Store Road**	City: Greenfield	State: **Tn**	Zip: **38230**	☐ Correspondence ☐ Invoice
Phone number(s): **731-514-3839**	E-mail: **d_galey@hotmail.com**			
Optional Contact:	Title or Position:			
Address:	City:	State:	Zip:	☐ Correspondence ☐ Invoice
Phone number(s):	E-mail:			

APPLICATION CERTIFICATION AND SIGNATURE (must be signed in accordance with the requirements of Rule 1200-4-5-.05)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name and title, print or type	Signature	Date
Derek Galey Owner	Derek Galey	**10-14-12**

STATE USE ONLY

Received Date	Reviewer	EFO	T & E Aquatic Fauna	Tracking No.
	Impaired Receiving Stream	High Quality Water		NOC Date

CN-1147 (Rev. 7-10)

continued

RDA 2366

Bear Creek Farm, Derek Galey Owner

Declarations to Nutrient Management Plan:

By my signature below, I affirm that I have read, understand, and will comply with the following stipulations from Tennessee's CAFO regulations that apply to my CAFO operation:

1) All animals in confinement are prevented from coming in direct contact with waters of the state.
2) All chemicals and other contaminants handled on-site are not disposed of in any manure, litter, process wastewater, or storm water storage or treatment system unless specifically designed to treat such chemicals and other contaminants.
3) Pesticide-contaminated waters will be prevented from discharging into waste retention structures. Waste from pest control and from facilities used to manage potentially hazardous or toxic chemicals shall be handled and disposed of in a manner that will prevent pollutants from entering waste retention structures or waters of the state.
4) Chemicals, manure/litter, and process wastewater will be managed to prevent spills. Spill clean-up plans will be developed and any equipment needed for spill clean-up will be available to facility personnel.
5) All sampling of soil and manure/litter is conducted according to protocols developed by UT Extension.
6) All records outlined in the permit that I am applying for will be maintained and available on-site.
7) Any confinement buildings, waste/wastewater handling or treatment systems, lagoons, holding ponds, and any other agricultural waste containment/treatment structures constructed or modified after April 13, 2006, are or will be located in accordance with NRCS Conservation Practice Standard 313.
8) A copy of the most recent Nutrient Management Plan will be kept as part of the farm records and will be maintained and implemented as written.
9) If applicable, all waste directed to under floor pits shall be composed entirely of wastewater (i.e. washwater and animal waste).
10) The Tennessee Department of Environment and Conservation Division of Water Resources will be notified of any significant wildlife mortalities near retention ponds or following any land application of animal wastes to fields.
11) All employees involved in work activities that relate to permit compliance will receive regular training on proper operation and maintenance (O&M) of the facility and waste disposal. Training shall include appropriate topics, such as land application of wastes, good housekeeping and material management practices, proper O&M of the facility, record keeping, and spill response and clean up. The periodic scheduled dates for such training shall be identified in the current Nutrient Management Plan.
12) There shall be no land application of nutrients within 24 hours of a precipitation event that may cause runoff. The operator shall not land apply nutrients to frozen, flooded, or saturated soils.

Signature of CAFO Owner/Operator

12-7-12
Date

NRCS Natural Resources Conservation Service

Comprehensive Nutrient Management Plan (CNMP)
(Version 2, 9/14/2011 Format)

The Comprehensive Nutrient Management Plan (CNMP) is an important part of the conservation management system (CMS) for your Animal Feeding Operation (AFO). This CNMP documents the planning decisions and operation and maintenance for the animal feeding operation. It includes background information and provides guidance, reference information and Web-based sites where up-to-date information can be obtained. Refer to the Producer Activity Document (PAD) for information about day-to-day management activities and recordkeeping. Both this CNMP document and the PAD document shall remain in the possession of the producer/landowner.

Farm/Facility: Bear Creek Farm
c/o Derek Galey
Bear Creek Road
McKenzie, TN 38201
731-514-3839

Owner/Operator: Derek Galey

Farm Headquarters Latitude/Longitude: 36.11816, -88.65349

Plan Period: Oct 2012 - Sep 2017

Certified Conservation Planner

As a Certified Conservation Planner, I certify that I have reviewed both the *Comprehensive Nutrient Management Plan* and *Producer Activity Document* for technical adequacy and that the elements of the documents are technically compatible, reasonable and can be implemented.

Signature: J.S. Workman IV Date: 10-14-12
Name: J.S. Workman IV
Title: Workman Consulting LLC Certification Credentials: TSP 10-6884

Conservation District

As a Soil and Water Conservation District employee, I have reviewed both the *Comprehensive Nutrient Management Plan* and *Producer Activity Document* and concur that the plan meets the District's conservation goals.

Signature: _____ Date: _____
Name:
Title:

RECEIVED
DEC 16 2012

Owner/Operator

As the owner/operator of this CNMP, I, as the decision maker, have been involved in the planning process and agree that the items/practices listed in each element of the CNMP are needed. I understand that I am responsible for keeping all the necessary records associated with the implementation of this CNMP. It is my intention to implement/accomplish this CNMP in a timely manner as described in the plan.

Signature: Derek Galey Date: 10-14-12
Name: Derek Galey, Owner

Section 2. Manure and Wastewater Handling and Storage

Signature: J.T. Workman IV Date: 10-14-12
Name: J.T. Workman IV
Title: Workman Consulting LLC Certification Credentials: TSP 10-6884

Sections 4. Land Treatment

Signature: _____ Date: _____
Name:
Title: Certification Credentials:

Section 6. Nutrient Management

The Nutrient Management component of this plan meets the Tennessee Nutrient Management 590 and Waste Utilization 633 Conservation Practice Standards.

Signature: J.T. Workman IV Date: 10-14-12
Name: J.T. Workman IV
Title: Workman Consulting LLC Certification Credentials: TSP 10-6884

Section 7. Feed Management (If applicable)

Signature: _____ Date: _____
Name:
Title: Certification Credentials:

Section 8. Other Utilization Options (If applicable)

Signature: _____ Date: _____
Name:
Title: Certification Credentials:

Table of Contents

Section 1. Background and Site Information

1.1. General Description of Operation

Derek Galey will be building 2 2,480 head deep pit hog barns to be contracted by Jimmy Tosh of Henry, Tn. Mr. Tosh will provide pigs and feed management. These buildings are planned to be constructed spring of 2013. All manure will be exported to Scarbrough Farms of McKenzie Tn. The closest house is 4,000 feet away and the closest blue line stream is also about 950 feet away. This stream will eventually run into Bear Creek. Watershed TN08010203001. Engineering Designs for pit are attached at the end of the document and meet NRCS Code 313 standards.

1.2. Sampling, Calibration and Other Statements

- Manure sampling frequency
  Manure test will be taken each time manure is sold.
- Soil testing frequency
  No soil testing is required
- Equipment calibration method and frequency
  No calibration required manure is sold.
- Clean water diversion
  No clean water will enter pit. It is sealed off from outside water.
- Measures to prevent direct contact of animals with water
  All animals will remain inside above the under floor pit.

1.3. Natural Resource Concerns

If checked, the indicated resource concerns have been identified and have been addressed in this plan.

Soil Quality Concerns

	Soil Quality Concern	*Activities to Address Concern*
	Ephemeral Gully Erosion	
	Gully Erosion	
X	Sheet and Rill Erosion	Around buildings will be seeded once construction is complete. See Critical Area Planting Code on page 9.
	Stream/Ditchbank Erosion	
	Wind Erosion	

Water Quality Concerns

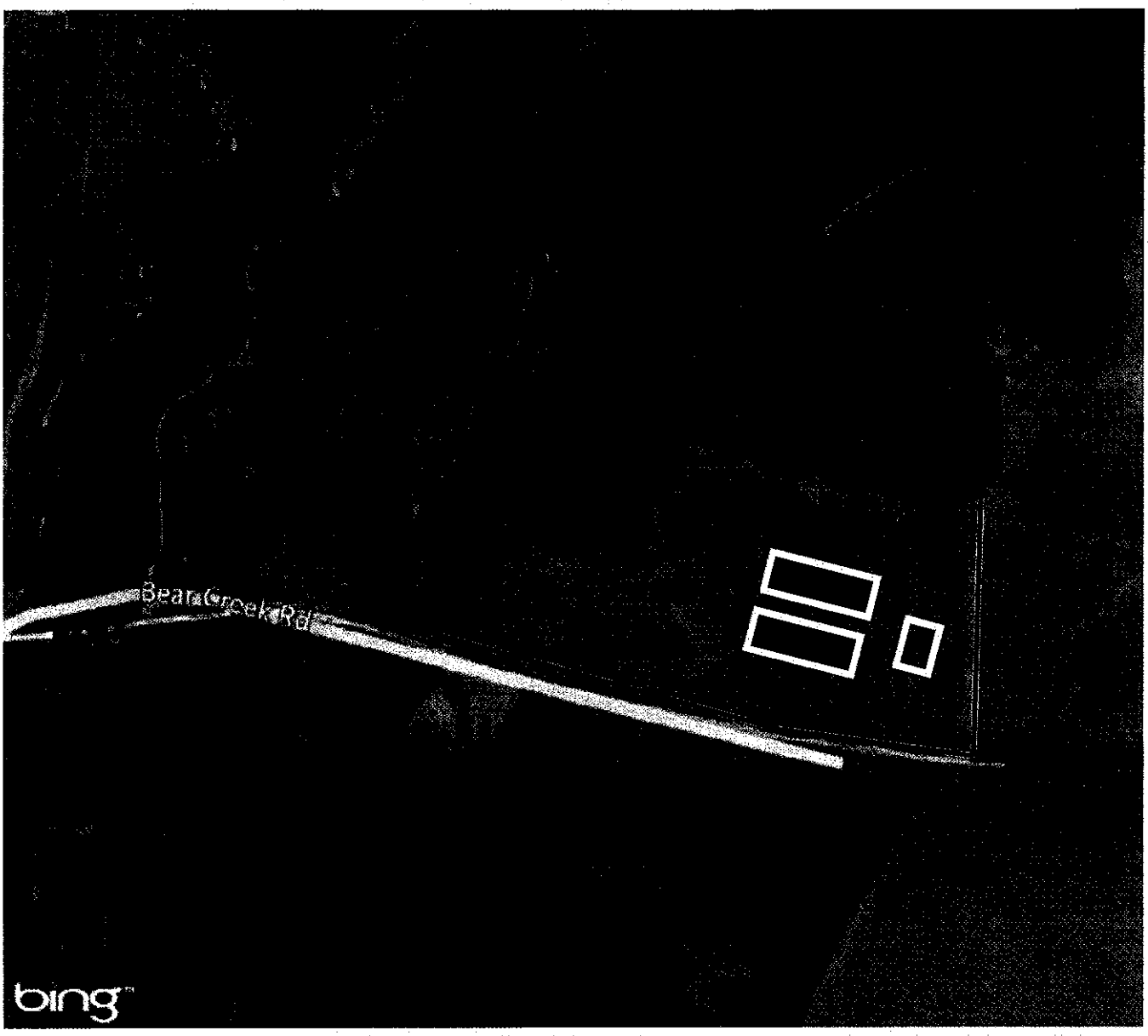
	Water Quality Concern	*Activities to Address Concern*
X	Facility Wastewater Runoff	Manure is in pit with a roof.
	Manure Runoff (Field Application)	
X	Manure Runoff (From Facilities)	Manure is sealed from outside environment and is sold to Scarbrough Farms
	Nutrients in Groundwater	
	Nutrients in Surface Water	
	Silage Leachate	
	Excessive Soil Test Phosphorus	
	Tile-Drained Fields	

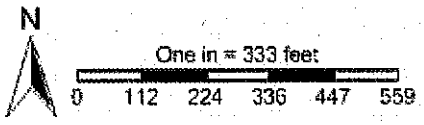
Other Concerns Addressed

	Other Concern	*Activities to Address Concern*
X	Acres Available for Manure Application	Manure Sold.
	Aesthetics	
	Maximize Nutrient Utilization	
	Minimize Nutrient Costs	
X	Neighbor Relations	Closest House is 4,000 feet away.
	Profitability	
X	Regulations	All regulation being met.
	Soil Compaction	
	Time Available for Manure Application	
	Odors	
	Air Quality	
X	Biosecurity	Plan In place.

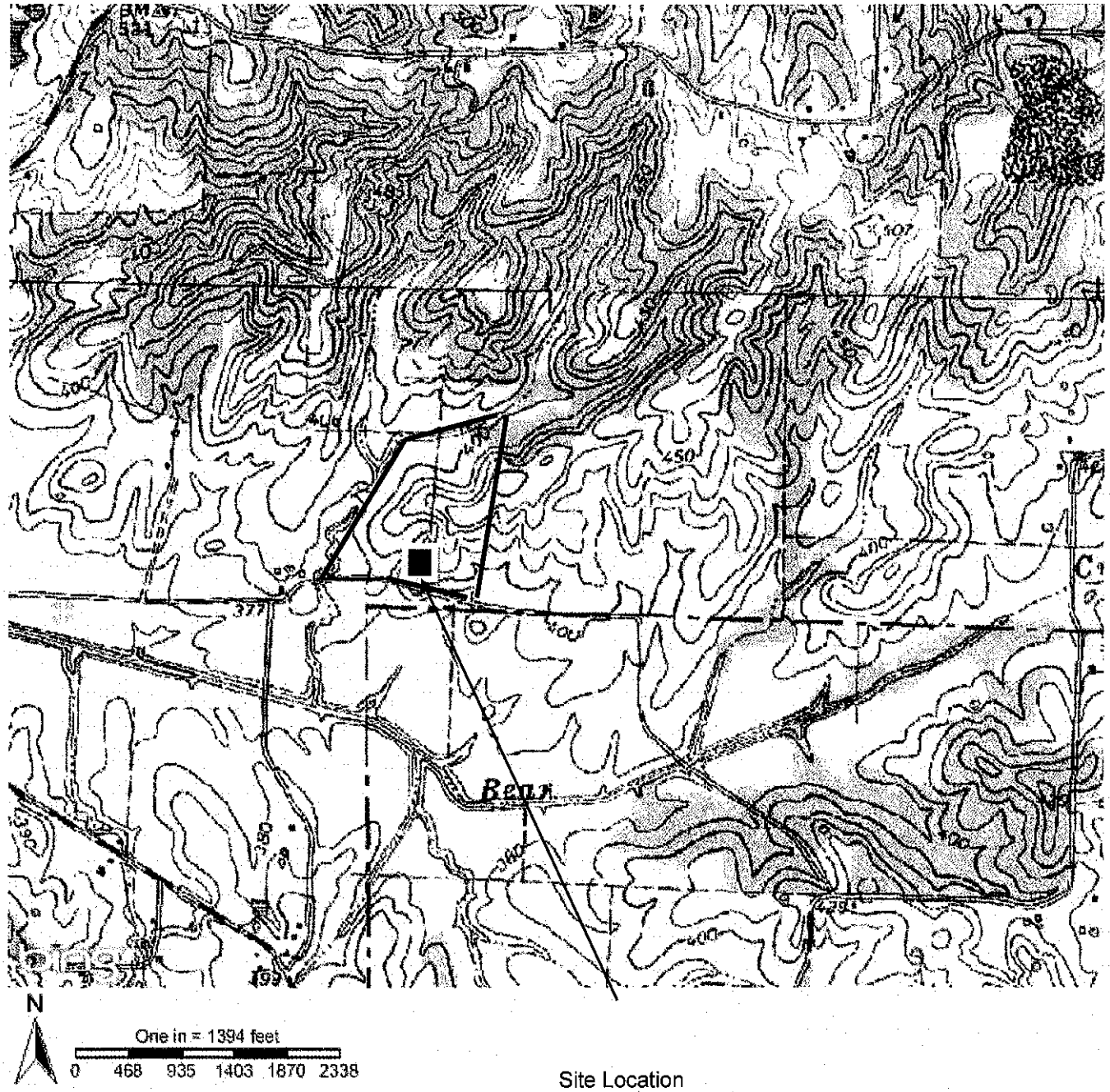
Section 2. Manure and Wastewater Handling and Storage

2.1. Map(s) of Production Area





Black Boxes are location of new buildings and green box is suggested location of compost building.



Site Location

2.2. Production Area Conservation Practices

This facility will consist of 2 buildings with deep pits underneath and a compost building.

Critical Area Planting (342)

Barn(s)	Planned amount (No.)	Month	Year	Amount Applied	Date
1	1.0	7	2013		
2	1.0	7	2013		
Composter	1	7	2013		
Total	3.0				

Critical area planting will be done to stabilize the soil, reduce damage from sediment and runoff to downstream areas, and improve wildlife habitat and visual resources. Adapted vegetation such as trees, shrubs, vines, grasses, or legumes will be established to limit severe erosion or sediment damage. See additional narrative for specific recommendations on seeding rates, dates, fertility requirements, and construction shaping required.
Or
Maintain areas around buildings and composter to ensure clean water is diverted from production areas and erosion is limited.

Heavy Use Area Protection (561)

Barn(s)	Planned amount (No.)	Month	Year	Amount Applied	Date
1	1.0	7	2013		
2	1.0	7	2013		
Composter	1	7	2013		
Total	3.0				

Protect heavily used areas by providing soil protection with vegetation, surfacing material or mechanical structures.

Composting Facility (317)

Create composting facility to properly dispose of dead hogs. Compost will need to be tested for nutrient levels. See Practice Standard 317.

Field(s)	Planned amount (No.)	Month	Year	Amount Applied	Date
1	1.0	7	2013		
Total	1.0				

All dead pigs must be immediately put in the compost facility and covered with a carbon matter. Suggested carbon matter is sawdust.

All NRCS conservation practices shall be installed, operated and maintained according to NRCS conservation practice standards and associated technical specifications.

UT Extension
W256

Composting Small Ruminants in Tennessee

Ricky C. Skillington, Central Region Goat Specialist

Producers of small ruminants have long been plagued with the issue of how to dispose of dead production animals, as well as afterbirth and stillborn animals. Traditionally, small ruminant producers in Tennessee have limited land areas that they use for this livestock enterprise. Many times, the available land is already in use for pastures and other production parts of the enterprise. Often, this land is totally unsuited for other enterprises. To protect the health of both ruminant herds and farm personnel; avoid air, soil and water contamination; and avoid problems with both agricultural and non-agricultural neighbors, the producer must use both biologically and environmentally safe methods of dead animal disposal.

In many cases, composting is the only viable avenue that these producers have to dispose of dead animals. Composting is a planned and managed process that promotes aerobic degradation of organic matter. The action of Thermophilic aerobic bacteria converts nitrogen-rich (dead animals) and carboniferous (straw, sawdust, etc.) materials into humic acids, bacterial biomass and organic residue. During the process, heat, carbon dioxide and water are generated as by-products. The resulting product is free from harmful pathogens, is nutrient-rich and can be used as fertilizer.

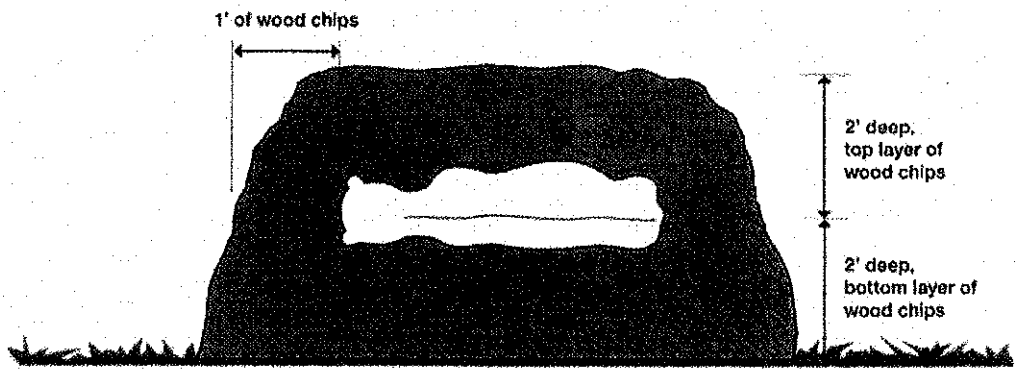
In composting, the material mix is very important. A proper balance of carbon and nitrogen is required to have a clean, efficient composting unit. When the balance is correct, along with adequate levels of air and water, the composting process results in nearly complete disposal of dead ruminants with little odor and run-off.

Producers need to understand that wool will not compost. Recently, I dug into a compost pile that was more than 20 years old and found wool that had been buried for more than 10 years that was still intact. It did show some water damage, but the composting had not destroyed the wool. Hair, on the other hand, seems to compost well.

Producers can use straw, decomposing hay, spoiled silage or even manure to compost small ruminants, but sawdust or wood chips seem to be best. A combination of waste forages as a base with sawdust or wood chips as the cover material seems to have served well in other areas of composting.

A simple system that has worked in similar operations consists of a bin with a concrete bottom and wood sides. The boards on the sides should have ½- to ¾-inch gaps between the boards to insure proper airflow. Bins should be located close to a water source, but not in direct contact with the herd or flock. Having a water source close will allow additional moisture to be added as needed to insure that the 50-60 percent moisture level in maintained during the composting process.

Some producers have found that a roof or cover is advantageous when composting during periods of excessive rainfall. While it is not necessary to have such a bin, a container of some type is helpful to control the amount of carbon-based materials used in the composting. A single bin of 8 to 10 square feet should be adequate for a flock or herd of 25 to 30 head. This is extremely important because of the limited amount of sawdust available in most areas. Producers can contact tree-trimming services and ask to have chips from their chipper unloaded. This



will provide a ready source of carbon for composting, but will require the producer to have a place to store the chips. The chips do not have to be stored under shelter, but need to be in an area that is accessible in all types of weather.

For a composter to work at its best, the carbon-to-nitrogen ratio should be 30:1 (30 parts carbon to 1 part nitrogen). The carbon source is very important in allowing air penetration and holding moisture in the pile. While wood chips tend to dry out more quickly than sawdust, chips are much better in allowing needed oxygen flow into the compost area. To encourage bacterial growth and rapid composting, the mixture must be 50-60 percent moisture. If a handful feels moist, but no water can be squeezed from it, the mixture is probably okay. Another positive for the wood chips is that they tend to absorb odor and retain good "structure" for long periods of time. This means that they allow air to naturally pass into and filter out of the covered carcass.

In static pile composting, the following steps need to be carried out. First, spread a layer of 2 feet of carbon. If not using a bin, this layer should be on a slight slope that is downhill from property lines, water sources or sink holes. Next, the material to be composted should be placed squarely on the center of the base material with all sides and extremities at least 1 foot away from the edge. (Closer proximately to sides of a bin is acceptable. If composting is done without a bin, the full 1 foot from the side is recommended). The third step should be covering the carcass with the carbon source at least 2 feet deep. Research has shown that a 120-pound carcass will require about 12 cubic feet of sawdust or wood chips. It is important to remember that the cover material should be mounded to prevent rain from collecting on the pile. Producers may want to purchase a 3-foot composting thermometer to use in monitoring the pile. These are very handy to make sure that the pile is heating up properly. When the temperature remains above 130 degrees F for three consecutive days, disease-causing pathogens within the pile will be destroyed. In most cases, vermin will not disturb the composting pile, but it may be necessary, if using the bin method, to place a barrier across the front of the bin.

In most cases of active composting, the carcass will be transformed into a substance that can be used as a fertilizer. Turning the pile occasionally will speed up the degradation, but is not required if the compost pile has been constructed correctly. Once the bin or compost pile has been started, the process works well and is low in cost, has little odor, does not promote the growth of flies or other annoying insects and is environmentally friendly.

THE UNIVERSITY of TENNESSEE UT
INSTITUTE of AGRICULTURE

Visit the UT Extension website at
http://utextension.tennessee.edu

W256 2/11 11-0120

2.3. Manure Storage

Storage ID	Type of Storage	Pumpable or Spreadable Capacity	Annual Manure Collected	Maximum Days of Storage
Barn 1	In-house storage pit	1,092,596 Gal	800,000 Gal	498
Barn 2	In-house storage pit	1,092,596 Gal	800,000 Gal	498

Manure production comes from a farm of identical size and number of animals with the same integrator. Production from this site shows plenty of space to hold one year's worth of manure. It is also suggested that 2 foot freeboard is maintained in pit. These pits will have dimensions of 195.58' L x 99.58' W x 8' D 0.5 Freeboard (In Feet). The 6 inch freeboard is maximum it is suggested that at two feet of freeboard remaining that Mr. Galey contact Mr. Scarbrough to start pumping.

2.4. Animal Inventory

Animal Group	Type or Production Phase	Number of Animals	Average Weight (Lbs)	Confinement Period	Manure Collected (%)	Storage Where Manure Will Be Stored
Pigs 1	Wean-to-finish pig	2,480	140	Jan Early - Dec Late	100	Barn 1
Pigs 2	Wean-to-finish pig	2,480	140	Jan Early - Dec Late	100	Barn 2

(1) Number of Animals is the average number of animals that are present in the production facility at any one time.
(2) If Manure Collected is less than 100%, this indicates that the animals spend a portion of the day outside of the production facility or that the production facility is unoccupied one or more times during the confinement period.

Average weight comes from top weight 270 + beginning weight of 10 = 280 / 2= 140. This facility will have approximately 2 turns a year.

2.5. Normal Animal Mortality Management

To decrease non-point source pollution of surface and ground water resources, reduce the impact of odors that result from improperly handled animal mortality, and decrease the likelihood of the spread of disease or other pathogens, approved handling and utilization methods shall be implemented in the handling of normal mortality losses. If on-farm storage or handling of animal mortality is done, NRCS Standard 316, Animal Mortality Facility, will be followed for proper management of dead animals.

Plan for Proper Animal Mortality Management

The following narrative describes how normal animal mortality will be managed in a manner that protects surface and ground water quality.

Galey Farms will build a concrete compost building with a roof. The farm will use a carbon matter such as sawdust to cover dead pigs. The farm will provide some form of a fence to keep animals out. The composter will be turned bi-annually or more often if necessary. If compost is land applied a sample will be taken sent to an accredited lab and then applied according to NRCS Code 590 and shown in records. However, this facility is not expected to generate enough dead animals to need to land apply because death should stay below 3%. Other facilities with Tosh Farms have built composters of the same size and they have not needed to land apply during the first permit period.

2.6. Planned Manure Exports off the Farm

Month-Year	Manure Source	Amount	Receiving Operation	Location
Jul 2013	Barn 1	666,000 Gal	No Production	
Jul 2013	Barn 2	666,000 Gal	No Production	
Mar 2014	Barn 1	532,800 Gal	Lynn Scarbrough Farms	McKenzie, Tn
Mar 2014	Barn 2	532,800 Gal	Lynn Scarbrough Farms	McKenzie, Tn
Mar 2015	Barn 1	799,200 Gal	Lynn Scarbrough Farms	McKenzie, TN
Mar 2015	Barn 2	799,200 Gal	Lynn Scarbrough Farms	McKenzie, Tn
Mar 2016	Barn 1	799,200 Gal	Lynn Scarbrough Farms	McKenzie, TN
Mar 2016	Barn 2	799,200 Gal	Lynn Scarbrough Farms	McKenzie, Tn
Mar 2017	Barn 1	799,200 Gal	Lynn Scarbrough Farms	McKenzie, TN
Mar 2017	Barn 2	799,200 Gal	Lynn Scarbrough Farms	McKenzie, Tn

Lynn Scarbrough
731-694-9642
319 Highway 190
McKenzie, Tn 38201

Plan starts in October of 2012. However, pig placement won't occur until approximately July of 2013 because construction won't start until Spring 2013.

2.7. Planned Manure Imports onto the Farm

Month-Year	Manure's Animal Type	Amount	Originating Operation	Location

(None)

2.8. Planned Internal Transfers of Manure

Month-Year	Manure Source	Amount	Manure Destination

(None)

Section 3. Farmstead Safety and Security

3.1. Emergency Response Plan

In Case of an Emergency Storage Facility Spill, Leak or Failure

Implement the following first containment steps:

a. Stop all other activities to address the spill.
b. Stop the flow. For example, use skid loader or tractor with blade to contain or divert spill or leak.
c. Call for help and excavator if needed.
d. Complete the clean-up and repair the necessary components.
e. Assess the extent of the emergency and request additional help if needed.

In Case of an Emergency Spill, Leak or Failure during Transport or Land Application

Implement the following first containment steps:

a. Stop all other activities to address the spill and stop the flow.
b. Call for help if needed.
c. If the spill posed a hazard to local traffic, call for local traffic control assistance and clear the road and roadside of spilled material.
d. Contain the spill or runoff from entering surface waters using straw bales, saw dust, soil or other appropriate materials.
e. If flow is coming from a tile, plug the tile with a tile plug immediately.
f. Assess the extent of the emergency and request additional help if needed.

Emergency Contacts

Department / Agency	Phone Number
Fire	731-235-2645
Rescue services	911
State veterinarian	615-837-5183
Sheriff or local police	911

Nearest available excavation equipment/supplies for responding to emergency

Equipment Type	Contact Person	Phone Number
Dozer and Trackhoe	Lynn Scarbrough	731-694-9642

Contacts to be made by the owner or operator within 24 hours

Organization	Phone Number
EPA Emergency Spill Hotline	1-800-424-8802
County Health Department	731-364-2210
Other State Emergency Agency	1-888-891-8332 TDEC's Water Pollution Control

Be prepared to provide the following information:

a. Your name and contact information.
b. Farm location (driving directions) and other pertinent information.
c. Description of emergency.
d. Estimate of the amounts, area covered, and distance traveled.
e. Whether manure has reached surface waters or major field drains.
f. Whether there is any obvious damage: employee injury, fish kill, or property damage.
g. Current status of containment efforts.

3.2. Biosecurity Measures

Biosecurity is critical to protecting livestock and poultry operations. Visitors must contact and check in with the producer before visiting the operation or entering any production or storage facility.

The following narrative describes how animal veterinary wastes (including medical equipment, empty containers, sharps and expired medications) will be managed at the operation.

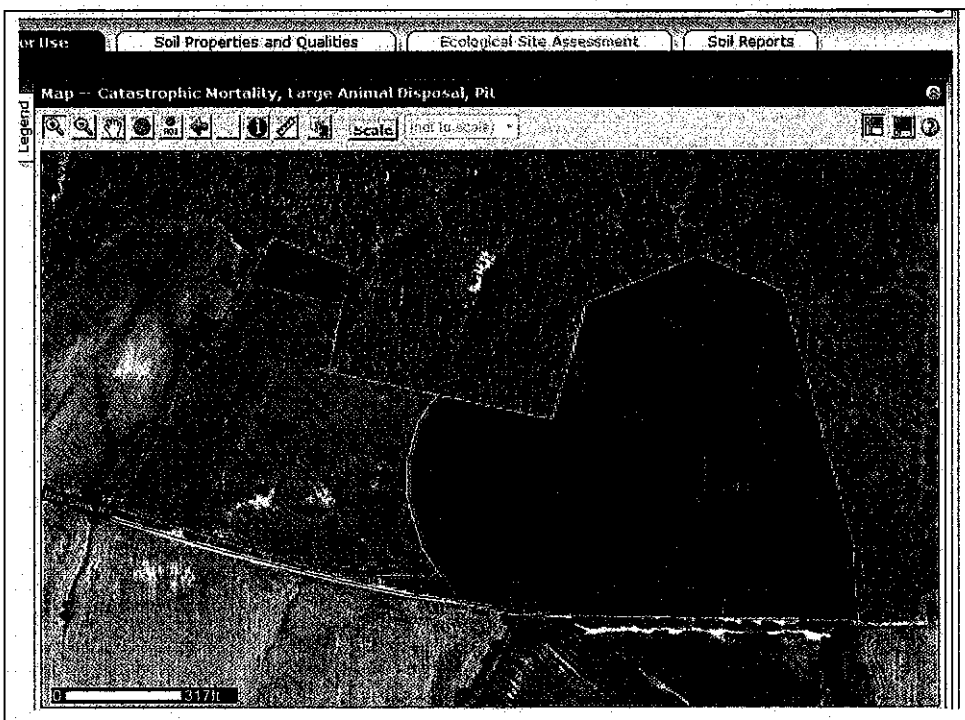
Medicine will be disposed to as directed on label. Needles and other sharps will be put in to a sharps container. If any medicine is left it shall remain in the control rooms or in a building that is protected from outside environment and stored according to label.

3.3. Catastrophic Animal Mortality Management

Refer to NRCS standards, or state guidance, regarding appropriate catastrophic animal mortality handling methods.

Plan for Catastrophic Animal Mortality Management

The following narrative describes how catastrophic animal mortality will be managed in a manner that protects surface and ground water quality. All national, state and local laws, regulations and guidelines that protect soil, water, air, plants, animals and human health must be followed.



Summary by Map Unit — Weakley County, Tennessee (TN183)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
Subtotals for Soil Survey Area					27.6	92.4%
Totals for Area of Interest					29.9	100.0%

able — Catastrophic Mortality, Large Animal Disposal, Pit — Summary by Rating Value

Summary by Rating Value

Rating	Acres in AOI	Percent of AOI
Very limited	20.3	67.7%
Somewhat limited	9.7	32.3%
Totals for Area of Interest	29.9	100.0%

escription — Catastrophic Mortality, Large Animal Disposal, Pit

"Catastrophic mortality, large animal disposal, pit," is a method of disposing of dead animals by placing the carcasses in successive layers in an excavated pit. The carcasses are spread, compacted, and covered daily with a thin layer of soil that is excavated from the pit. When the pit is full, a final cover of soil material at least 2 feet thick is placed over the burial pit.

The interpretation is applicable to both heavily populated and sparsely populated areas. While some general observations may be made, onsite evaluation is required before the final site is selected. Improper site selection, design, or installation may cause contamination of ground water, seepage, and contamination of stream systems from surface drainage or floodwater. The risk of contamination can be reduced or eliminated by installing systems designed to eliminate or reduce the adverse effects of limiting soil properties. Ratings are for soils in their present condition. The present land use is not considered in the ratings.

Ratings are based on properties and qualities to the depth normally observed during soil mapping (approximately 6 or 7 feet). However, because pits may be as deep as 15 feet or more, geologic investigations are needed to determine the potential for pollution of ground water and to determine the design needed. These investigations, which are generally arranged by the pit developer, include examination of stratification, rock formations, and geologic conditions that might lead to the conducting of leachates to aquifers, wells, watercourses, and other water sources. The presence of hard, nonrippable bedrock, bedrock crevices, or highly permeable strata at or directly below the proposed pit bottom is undesirable because of the difficulty in excavation and the potential pollution of underground water.

Properties that influence the risk of pollution, ease of excavation, trafficability, and revegetation are major considerations. Soils that are flooded or have a water table within the depth of excavation present a potential pollution hazard and are difficult to excavate. Slope is an important consideration because it affects the work involved in road construction, the performance of the roads, and the control of surface water around the pit. It may also cause difficulty in constructing pits in which the pit bottom must be kept level and oriented to follow the contour of the land.

The ease with which the pit is dug and with which a soil can be used as daily and final cover is based largely on soil texture and consistence, which determine workability when the soil is dry and when it is wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and difficult to place as a uniformly thick cover over a layer of carcasses. The uppermost part of the final cover should be soil material that favors the growth of plants. It should not contain excess sodium or salts and should not be too acid. In comparison with other horizons, the surface layer in most soils has the best workability and the highest content of organic matter. Thus, it may be desirable to stockpile the surface layer for use in the final blanketing of the filled pit area.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected of a properly designed and installed system. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of the individual limitations. The ratings are shown in decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Area in yellow is suited for burial of catastrophic events. Contact state vet and Tosh Farms before beginning to bury animals.

Important! In the event of catastrophic animal mortality, contact the following authority before beginning carcass disposal:

Authority name State Vet
Contact name Charles Hatcher
Phone number 615-837-5183

3.4. Chemical Handling

If checked, the indicated measures will be taken to prevent chemicals and other contaminants from contaminating process waste water or storm water storage and treatment systems.

	This is not a regulatory-agency permitted facility. This section does not apply.

	Measure
X	All chemicals are stored in proper containers. Expired chemicals and empty containers are properly disposed of in accordance with state and federal regulations. Pesticides and associated refuse are disposed of in accordance with the FIFRA label.
X	Chemical storage areas are self-contained with no drains or other pathways that will allow spilled chemicals to exit the storage area.
X	Chemical storage areas are covered to prevent chemical contact with rain or snow.
X	Emergency procedures and equipment are in place to contain and clean up chemical spills.
X	Chemical handling and equipment wash areas are designed and constructed to prevent contamination of surface waters and waste water and storm water storage and treatment systems.
X	All chemicals are custom applied and no chemicals are stored at the operation. Equipment wash areas are designed and constructed to prevent contamination of surface waters and waste water and storm water storage and treatment systems.

Section 4. Land Treatment

4.1. Map(s) of Fields and Conservation Practices

4.2. Land Treatment Conservation Practices

All NRCS conservation practices shall be installed, operated and maintained according to NRCS conservation practice standards and associated technical specifications.

Section 5. Soil and Risk Assessment Analyses

5.1. Soil Information

Field	Soil Survey	Map Unit	Soil Component Name	Surface Texture	Slope Range (%)	OM Range (%)	Bedrock Depth (in.)

5.2. Predicted Soil Erosion

Average water, wind, irrigation, gully and ephemeral soil loss

Field	Predominant Soil Type	Slope (%)	Water (Ton/A/Yr)	Wind (Ton/A/Yr)	Irrigation (Ton/A/Yr)	Gully (Ton/A/Yr)	Ephemeral (Ton/A/Yr)	Total (Ton/A/Yr)	T Factor (Ton/A/Yr)

5.3. Nitrogen and Phosphorus Risk Analyses

Tennessee Phosphorus Index

Field	Crop Year	Site and Transport Factor	Mgmt. and Source Factor	P Index w/o P Apps	P Index w/ P Apps	P Loss Risk

5.4. Additional Field Data Required by Risk Assessment Procedure(s)

Tennessee Phosphorus Index

Field	Distance to Water (Feet)	Slope Length (Feet)	Buffer Width (Feet)	Tillage/Cover Type

Section 6. Nutrient Management

6.1. Field Information

Field ID	Sub-field ID	Total Acres	Spread-able Acres	County	Predominant Soil Type	Slope (%)	Watershed Code	FSA Farm	FSA Tract	FSA Field

6.2. Manure Application Setback Distances

Setback Requirements: NRCS Standard

Feature	Setback Criteria	Setback Distance (Feet)

(None)

Source: Nutrient Management Standard 590 (http://efotg.nrcs.usda.gov/references/public/TN/Nutrient_Management_(590)_Standard.doc)

6.3. Soil Test Data

Field	Test Year	OM (%)	P Test Used	P	K	Mg	Ca	Units	Soil pH	Buffer pH	CEC (meq/ 100g)

6.4. Manure Nutrient Analyses

Manure Source	Dry Matter (%)	Total N	NH_4-N	Total P_2O_5	Total K_2O	Avail. P_2O_5	Avail. K_2O	Units	Analysis Source and Date
Barn 1		20.6	18.9	8.6	18.2	8.6	18.2	Lb/1000Gal	Manure Analysis and Volume is from Tosh Brevard
Barn 2		23.3	20.8	11.9	21.1	11.9	21.1	Lb/1000Gal	Manure Analysis and Volume is from Tosh Brevard

(1) Entered analysis may be the average of several individual analyses.
(2) Tennessee assumes that 100% of manure phosphorus and 100% of manure potassium is crop available. First-year per-acre nitrogen availability for individual manure applications is given in the Planned Nutrient Applications table. For more information about nitrogen availability in Tennessee, see "Manure Application Management," Tables 3 and 4, Tennessee Extension, PB1510, 2/94 (http://wastemgmt.ag.utk.edu/Pubs/PB1510.pdf).

6.5. Planned Crops and Fertilizer Recommendations

Field	Crop Year	Planned Crop	Yield Goal (per Acre)	N Rec (Lbs/A)	P_2O_5 Rec (Lbs/A)	K_2O Rec (Lbs/A)	N Removed (Lbs/A)	P_2O_5 Removed (Lbs/A)	K_2O Removed (Lbs/A)	Custom Fert. Rec. Source

* Unharvested cover crop or first crop in double-crop system.
[a] Custom fertilizer recommendation.

6.6. Manure Application Planning Calendar – October 2012 through September 2013

Field	Total Acres	Spread. Acres	Predominant Soil Type	Primary 2013 Crop (Prev. Primary Crop)	Oct '12	Nov '12	Dec '12	Jan '13	Feb '13	Mar '13	Apr '13	May '13	Jun '13	Jul '13	Aug '13	Sep '13
Total	*0.0*	*0.0*														

[redacted] No. indicates total loads
"X" indicates other manure apps

Manure Application Planning Calendar – October 2013 through September 2014

Field	Total Acres	Spread. Acres	Predominant Soil Type	Primary 2014 Crop (Prev. Primary Crop)	Oct '13	Nov '13	Dec '13	Jan '14	Feb '14	Mar '14	Apr '14	May '14	Jun '14	Jul '14	Aug '14	Sep '14
Total	*0.0*	*0.0*														

[redacted] No. indicates total loads
"X" indicates other manure apps

Manure Application Planning Calendar – October 2014 through September 2015

Field	Total Acres	Spread. Acres	Predominant Soil Type	Primary 2015 Crop (Prev. Primary Crop)	Oct '14	Nov '14	Dec '14	Jan '15	Feb '15	Mar '15	Apr '15	May '15	Jun '15	Jul '15	Aug '15	Sep '15
Total	*0.0*	*0.0*														

[redacted] No. indicates total loads
"X" indicates other manure apps

Manure Application Planning Calendar – October 2015 through September 2016

Field	Total Acres	Spread. Acres	Predominant Soil Type	Primary 2016 Crop (Prev. Primary Crop)	Oct '15	Nov '15	Dec '15	Jan '16	Feb '16	Mar '16	Apr '16	May '16	Jun '16	Jul '16	Aug '16	Sep '16
Total	*0.0*	*0.0*														

[redacted] No. indicates total loads
"X" indicates other manure apps

Manure Application Planning Calendar – October 2016 through September 2017

Field	Total Acres	Spread. Acres	Predominant Soil Type	Primary 2017 Crop (Prev. Primary Crop)	Oct '16	Nov '16	Dec '16	Jan '17	Feb '17	Mar '17	Apr '17	May '17	Jun '17	Jul '17	Aug '17	Sep '17
Total	*0.0*	*0.0*														

[redacted] No. indicates total loads
"X" indicates other manure apps

6.8. Field Nutrient Balance

Year	Field	Size	Crop	Yield Goal	Fertilizer Recs[1]			Nutrients Applied[2]			Balance After Recs[3]			Balance After Removal[4]	
		Acres		/Acre	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	N Lb/A	P_2O_5 Lb/A	K_2O Lb/A	P_2O_5 Lb/A	K_2O Lb/A

[1] Fertilizer Recs are the crop fertilizer recommendations. The N rec accounts for any N credit from previous legume crop.

[2] Nutrients Applied are the nutrients expected to be available to the crop from that year's manure applications plus nutrients from that year's commercial fertilizer applications and nitrates from irrigation water. With a double-crop year, the total nutrients applied for both crops and the year's balances are listed on the second crop's line.

[3] For N, Nutrients Applied minus Fertilizer Recs for indicated crop year. Also includes amount of residual N expected to become available that year from prior years' manure applications. For P_2O_5 and K_2O, Nutrients Applied minus Fertilizer Recs *through* the indicated crop year, with positive balances carried forward to subsequent years. Negative values indicate a potential need to apply additional nutrients.

[4] Nutrients Applied minus amount removed by harvested portion of crop through the indicated year. Positive balances are carried forward to subsequent years.

[¤] Indicates a custom fertilizer recommendation in the Fertilizer Recs column.

[a] Indicates in the Balance After Recs N column that the legume crop is assumed to utilize some or all of the supplied N.

† Indicates in the Balance After Recs N column that the value includes residual N expected to become available that year from prior years' manure applications.

6.9. Manure Inventory Annual Summary

Manure Source	Plan Period	On Hand at Start of Period	Total Generated	Total Imported	Total Trans-ferred In	Total Applied	Total Exported	Total Trans-ferred Out	On Hand at End of Period	Units
Barn 1	Oct '12 - Sep '13	0	800,000	0	0	0	666,000	0	134,000	Gal
Barn 2	Oct '12 - Sep '13	0	800,000	0	0	0	666,000	0	134,000	Gal
All Sources	**Oct '12 - Sep '13**	**0**	**1,600,000**	**0**	**0**	**0**	**1,332,000**	**0**	**268,000**	**Gal**
Barn 1	Oct '13 - Sep '14	134,000	800,000	0	0	0	532,800	0	401,200	Gal
Barn 2	Oct '13 - Sep '14	134,000	800,000	0	0	0	532,800	0	401,200	Gal
All Sources	**Oct '13 - Sep '14**	**268,000**	**1,600,000**	**0**	**0**	**0**	**1,065,600**	**0**	**802,400**	**Gal**
Barn 1	Oct '14 - Sep '15	401,200	800,000	0	0	0	799,200	0	402,000	Gal
Barn 2	Oct '14 - Sep '15	401,200	800,000	0	0	0	799,200	0	402,000	Gal
All Sources	**Oct '14 - Sep '15**	**802,400**	**1,600,000**	**0**	**0**	**0**	**1,598,400**	**0**	**804,000**	**Gal**
Barn 1	Oct '15 - Sep '16	402,000	800,000	0	0	0	799,200	0	402,800	Gal
Barn 2	Oct '15 - Sep '16	402,000	800,000	0	0	0	799,200	0	402,800	Gal
All Sources	**Oct '15 - Sep '16**	**804,000**	**1,600,000**	**0**	**0**	**0**	**1,598,400**	**0**	**805,600**	**Gal**
Barn 1	Oct '16 - Sep '17	402,800	800,000	0	0	0	799,200	0	403,600	Gal
Barn 2	Oct '16 - Sep '17	402,800	800,000	0	0	0	799,200	0	403,600	Gal
All Sources	**Oct '16 - Sep '17**	**805,600**	**1,600,000**	**0**	**0**	**0**	**1,598,400**	**0**	**807,200**	**Gal**

6.10. Fertilizer Material Annual Summary

Product Analysis	Plan Period	Product Needed Oct - Dec	Product Needed Jan - Sep	Total Product Needed	Units

6.11. Plan Nutrient Balance

	N (Lbs)	P_2O_5 (Lbs)	K_2O (Lbs)
Total Manure Nutrients on Hand at Start of Plan[1]	0	0	0
Total Manure Nutrients Collected[2]	175,600	82,000	157,200
Total Manure Nutrients Imported[3]	0	0	0
Total Manure Nutrients Exported[4]	157,882	73,726	141,339
Total Manure Nutrients on Hand at End of Plan[5]	17,718	8,274	15,861
Total Manure Nutrients Applied[6]	0	0	0
Available Manure Nutrients Applied[7]	0	0	0
Commercial Fertilizer Nutrients Applied[8]	0	0	0
Available Nutrients Applied[9]	0	0	0
Nutrient Utilization Potential[10]	0	0	0
Nutrient Balance of Spreadable Acres[11*]	0	0	0
Average Nutrient Balance per Spreadable Acre per Year[12*]	0	0	0

1. Values indicate total manure nutrients present in storage(s) at the beginning of the plan.
2. Values indicate total manure nutrients collected on the farm.
3. Values indicate total manure nutrients imported onto the farm.
4. Values indicate total manure nutrients exported from the farm to an external operation.
5. Values indicate total manure nutrients present in storage(s) at the end of plan.
6. Values indicate total nutrients present in land-applied manure. Losses due to rate, timing and method of application are not included in these values.
7. Values indicate available manure nutrients applied on the farm based on rate, time and method of application. These values are based on the total manure nutrients applied (row 6) after accounting for state-specific nutrient losses due to rate, time and method of application.
8. Values indicate nutrients applied as commercial fertilizers and nitrates contained in irrigation water.
9. Values are the sum of available manure nutrients applied (row 7) and commercial fertilizer nutrients applied (row 8).
10. Values indicate nutrient utilization potential of crops grown. For N the value generally is based on crop N recommendation for non-legume crops and crop N uptake or other state-imposed limit for N application rates for legumes. P_2O_5 and K_2O values generally are based on fertilizer recommendations or crop removal (whichever is greatest).
11. Values indicate available nutrients applied (row 9) minus crop nutrient utilization potential (row 10). Negative values indicate additional nutrient utilization potential and positive values indicate over-application.
12. Values indicate average per acre nutrient balance. Values are calculated by dividing nutrient balance of spreadable acres (row 11) by the number of spreadable acres in plan and by the length of the plan in years. Negative values indicate additional average per acre nutrient utilization potential and positive values indicate average per acre over-application.

* Non-trivial, positive values for N indicate that the plan was not properly developed. Negative values for N indicate additional nutrient utilization potential which may or may not be intentional. For example, plans that include legume crops often will not utilize the full N utilization potential for legume crops if manure can be applied to non-legume crops that require N for optimum yield. Positive values for P_2O_5 and/or K_2O do not necessarily indicate that the plan was not developed properly. For example, producers may be allowed to apply N-based application rates of manure to fields with low soil test P values or fields with a low potential P-loss risk based on the risk assessment tool used by the state. Negative values for P_2O_5 and K_2O indicate that planned applications to some fields are less than crop removal rates.

Record Keeping

This section includes a list of key records that Galey Farms will keep in order to document and verify implementation of the procedures in this CNMP. Records shall be kept for a minimum of 5 years, or for the length of the contract, rotation, or permit, whichever is longer, for each field where manure is applied.

These general records include but are not limited to:

1. Soil Test Results
2. Weather and soil conditions 24 hours prior to, during and 24 hours application of manure, chemicals and pesticides.
3. Type, quantities, and sources of all nutrients generated and collected
4. Type, quantities, and sources of all nutrients applied to each field
5. Dates of manure applications
6. Inspection Reports
7. Operation and Maintenance records of conservation practices and equipment
8. Restricted pesticides used to meet label requirements
9. Equipment Calibration records
10. Crops planted, tillage method and dates planted
11. Crop harvest dates and yield
12. Adjustments to nutrient management plan based on records and changes in farming operations as appropriate
13. Weekly check of volume in pit
14. Annual visual inspection of retention structure (pits), animal holding areas, if applicable and land application areas
15. Records of mortalities and how managed

Operation and Maintenance

Derek Galey is responsible for safe operation and maintenance of the nutrient management plan including all equipment. Operation and maintenance includes the following items:

1. periodic plan review to determine if adjustments or modifications to the plan are needed. As minimum, plans will be reviewed/revised with each soil test cycle.
2. weekly there will be a visual inspection of pits
3. calibration of application equipment to ensure uniform distribution of material at planned rates.
4. documentation of the actual rate at which nutrients were applied. When the actual rates used differ from or exceed the recommended and planned rates, records will indicate the reasons for the differences.
5. Maintaining records to document plan implementation. As applicable, records include
    a. Soil test results and recommendations for nutrient application
    b. Quantities, analysis and sources of nutrients applied
    c. Dates and method of nutrient applications
    d. Crops planted, planting and harvest dates, yields, and residues removed
    e. Results of water, plant and organic byproduct analysis
    f. Dates of review and person performing the review and recommendations
    g. Conservation practices being applied and Maintenance.

Critical Area Planting

Use of the area shall be managed as long as necessary to stabilize the site and achieve the intended purpose. Inspections, reseeding, or replanting, fertilization, and pest control may be needed to ensure that this practice functions as intended throughout its expected life. Replanting should be done where needed within one year after original planting. Mulching may also be needed after initial planting, if serious erosion persists. If rills or small gullies developed during establishment, but surrounding vegetation is well established, disk edge of the gully so sod falls in the gully and walk the sod in with tires. Hand placement of sod prior to walking it in is beneficial. Control or exclude pests that will interfere with the timely establishment of vegetation. Comply with all applicable federal, state, and local laws and regulations.

Heavy Use Area Protection

The Operation and Maintenance (O&M) plan shall specify that the treatment areas and associated practices will be inspected annually and after significant storm events to identify repair and maintenance needs. The O&M plan shall contain the operational requirements for managing the heavy use area. Planned scraping intervals, replacement of fine material, storage, treatment, and/or utilization methods will also be described. Provisions for re-establishment of vegetated areas will be included. The O&M plan shall detail the level of repairs needed to maintain the effectiveness and useful life of the practice. If using a front-end loader, recommend back dragging the manure/hay to conserve removal of gravel from the surface. Consider using fabricated large equipment tire for scraping surface. The O&M plan

shall be provided to, and discussed with, the operator. The O&M plan must complement the Comprehensive Nutrient Management Plan, as necessary.

Composting Facility

An operation and maintenance (O&M) plan shall be developed consistent with the purposes of this standard, its intended life, safety requirements, and the criteria for its design. The O&M plan shall include recipe ingredients and sequence that they are layered and mixed, maximum and minimum temperature for operation, land application rates, moisture level, management of odors, testing, etc. Make adjustments throughout the composting period to ensure proper composting processes. The compost facility should be inspected regularly when the facility is empty. Replace deteriorated wooden materials or hardware. Patch concrete floors and curbs as necessary to assure water tightness. Roof structures should be examined for structural integrity and repaired as needed. Exposed metal components should be inspected for corrosion. Corroded metal should be wire brushed and painted as necessary. Closely monitor temperatures above 165°F. Take action immediately to cool piles that have reached temperatures above 185°F. The operation and maintenance plan shall state that composting is a biological process. It requires a combination of art and science for success. Hence, the operation may need to undergo some trial and error in the start-up of a new composting facility.

Records will be maintained for five years or for a period longer than five years if required by other Federal, state, or local ordinances or program or contract requirements.

The disposal of material generated by the cleaning nutrient application equipment accomplished properly. Excess material should be collected and stored or field applied in an appropriate manner. Excess material should not be applied on areas of high potential risk for runoff and leaching.

The disposal/recycling of nutrient containers should be according to state and local guidelines or regulations.

Pesticides, toxic chemicals, and petroleum products will not be used in areas where leakage could enter the manure storage facility.

Section 10. References

10.1. Publications

Manure Application Setback Features/Distances

Nutrient Management Standard 590
http://efotg.nrcs.usda.gov/references/public/TN/Nutrient_Management_(590)_Standard.doc

Phosphorus Assessment

"Tennessee Phosphorus Index," Tennessee NRCS, Nov. 2001

Practice Standards

Tennessee NRCS Nutrient Management Standard (590), Jan. 2003
http://efotg.nrcs.usda.gov/references/public/TN/Nutrient_Management_(590)_Standard.doc

10.2. Software and Data Sources

MMP Version	MMP 0.3.1.0
MMP Plan File	DerekGaley.mmp 10/14/2012 9:51:24 AM
MMP Initialization File for Tennessee	11/8/2011
MMP Soils File for Tennessee	8/29/2011
Phosphorus Assessment Tool	2009.02.20
NRCS Conservation Plan(s)	n/a
RUSLE2 Library	n/a
RUSLE2 Database	n/a

THE UNIVERSITY of TENNESSEE Extension
W003

Livestock Waste Management and Conservation

Procedures for Manure and Litter Sampling

(Class I & II – Large and Medium CAFOs)
Tennessee CAFO Factsheet #14

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Nutrient composition of manure varies with a number of factors, including animal type, bedding, ration, storage and handling, environmental conditions, field application method, age of manure, timing of sampling and sampling technique. This variability makes book values (or averages) an unreliable source for determining application rates of nitrogen, phosphorus and potassium. Each livestock production operation and manure management system is unique, and an individual farm's manure analysis can vary from average values by 50 percent or more. Testing manure may better indicate how animal management and other factors actually affect nutrient contents and will allow for more accurate calculation of application rates.

The results of a manure analysis are only as reliable as the sample taken. A representative sample is needed to accurately reflect the nutrient content. However, obtaining a representative sample can be a challenge as manure nutrient content is not uniform within storage structures. Mixing and sampling strategies can insure that samples more accurately reflect the type of manure that will be applied.

When to Sample

The ideal time to sample manure is prior to application to ensure that results of the analysis are received in time to adjust nutrient application rates. However, do not allow long periods of time to pass before application begins, because there can be storage and handling losses over time. Sampling several days to a week prior to application is best. However, a complication of the timing of the sampling is that semi-solid (or slurry) manure should be well agitated before sampling, and in many situations, such as contracting waste application to a third party, agitators or other necessary equipment are not available until application begins. In cases such as this, "pre-sampling" (dipping samples off the top of the storage structure for N and K concentrations) can be used to estimate application rates (See page 4 for more info on pre-sampling).

Building a "bank" of manure analysis over time can be quite useful in the future as long as animal management practices, feed rations or manure storage and handling methods do not drastically change from present methods. If samples do not vary greatly from year to year or are consistent during spring or fall applications, the "bank" averages will help estimate application rates if an analysis cannot be performed prior to application.

Safety Precautions

It is more dangerous and more difficult to sample from liquid storage facilities than dry-manure systems. Proper precautions should be taken to prevent

accidents, such as falling into the storage facility or being overcome by manure gases.

1. Have two people present at all times;
2. Never enter confined manure-storage spaces without appropriate safety gear, such as a self-contained breathing apparatus;
3. When agitating a storage pit below a building, be sure to provide adequate ventilation for both humans and animals; and
4. When agitating outdoor pits, monitor activities closely to prevent erosion of berms or destruction of pit liners.

Sample Preparations

1. Check with the laboratory performing the analysis, as most of these labs have plastic bottles available for liquid sample collection or sealable plastic bags for dry samples (freezer bags work well). Additionally, they may have specific sample collection procedures, including holding times, refrigeration and shipping requirements.
2. Do not use glass containers, as expansion of the gases in the sample can cause the container to break.
3. Never use galvanized containers for collection or mixing due to the risk of contamination from metals like zinc in the container.
4. When taking liquid samples from facilities spreading both effluent and solids, the manure should be agitated for two to four hours before taking the sample.
5. Liquid samples can be taken during agitation (after two to four hours have passed) because most agitation equipment is effective 75 to 100 feet away from the equipment.
6. Take multiple samples from the storage facility and mix them together thoroughly in a larger bucket to obtain a representative sample. For liquid or semi-solid samples, use a stirring rod to get the solids spinning in suspension and collect the representative sample while the liquid is still spinning.
7. When taking liquid samples, fill the plastic bottle three-fourths full and leave at least 1 inch of air space to allow for gas expansion.
8. When taking dry samples, squeeze all of the excess air from the sealable plastic bag to allow for gas expansion and place the first bag into a second sealable plastic bag to prevent leaks.
9. Label the plastic bags or bottles prior to sampling with your name, date and sample identification number. Use a waterproof pen.
10. After sampling, place the container(s) in the refrigerator or freezer (preferred) until mailed to the lab. Cooling the samples will reduce microbial activity, chemical reactions and reduce odors.
11. Ship samples early in the week (Monday–Wednesday) using an overnight service. Avoid holidays and weekends.

Sampling Semi-Solid and Liquid Manure from Storage Facilities

Manure with 10 to 20 percent solids is classified as semi-solid manure and can usually be handled as a liquid. Semi-solid manure usually requires the use of chopper pumps to provide thorough agitation before pumping. Liquid manure is manure with less than 10 percent solids and is handled with pumps, pipes, tank wagons or irrigation equipment (if less than 5 percent solids).

If all contents of the entire semi-solid or liquid storage facility will be applied, complete agitation (2-4 hours minimum) is required to accurately sample the manure because in liquid and semi-solid systems, settled solids can contain more than 90 percent of the phosphorus. However, if solids will be purposefully left on the bottom when the storage structure is pumped out, as is sometimes the case with lagoons, then complete agitation during sampling will generate artificially high nutrient values. In this case, agitation of the solids or sludge at the bottom of the lagoon is not needed for nutrient analysis, and premixing the surface liquid in the lagoon is not needed.

Methods of Sampling:
Several different methods may be used to sample liquid or semi-solid manure from storage facilities:

1. Use a plastic sampling cup with a 10- to 12-foot handle to obtain surface water samples (see Figure 1). Collect about a pint of sample from several locations (six to eight) around the perimeter of the storage unit about 6 feet from the bank and 12 inches below the surface. Avoid floating debris or scum. Pour each of the samples into a clean plastic bucket and mix well. Pour representative sample in plastic container for shipping. *(Chastain, 2003)*
2. Throw a small plastic bucket tied to a long rope out towards the middle of the storage unit while holding onto the rope. Begin pulling the bucket back to the bank as soon as it strikes the surface. Make sure the bucket is raised above the surface before it strikes the bank. Pour each sample into a larger plastic bucket, and repeat this procedure at four to six locations evenly spaced around the perimeter of the storage unit. Mix all samples well and pour representative sample into a plastic container for shipping. *(Chastain, 2003)*
3. Samples may also be taken using a probe or a tube. They can be constructed out of a 1½-inch diameter PVC pipe. Cut the PVC pipe a foot longer than the depth of the pit. Run a ¼-inch rod or string through the length of the pipe and attach a plug such as a rubber stopper or rubber ball (see Figure 2). The rod or the string must be longer than the pipe. If using a rod, bend the top over to prevent it from falling out of the pipe. The probe should be slowly inserted into the pit or lagoon with the stopper open, to the full depth of the pit. Pull the string or rod to close the bottom of the pipe and pull the probe out of the pit, being careful not to tip the pipe and dump the sample. Release the sample into a large plastic bucket and repeat the process at least three times around the pit. Mix all samples well and pour a representative sample into a plastic container for shipping. *(Rieck-Hinz, 2003)*

Figure 1.

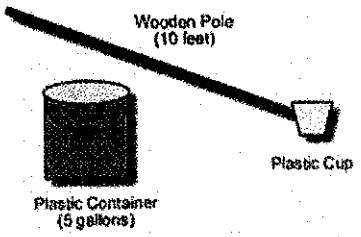
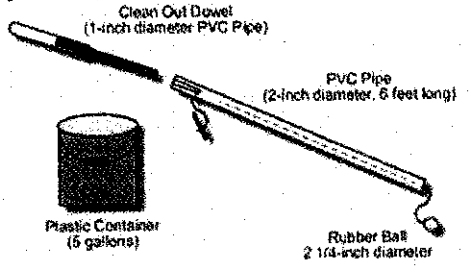


Figure 2.



Sampling Semi-Solid and Liquid Manure during Land Application with Tank Wagons
Settling begins as soon as agitation stops, so samples should be collected as soon as possible after the manure tank wagon is filled, unless the tanker has an agitator. Be sure the port or opening does not have a solids accumulation from prior loads. Collect samples in a plastic bucket from the loading or unloading port or the opening near the bottom of the tank. Stir the sample in the bucket to get the solids in suspension. Remove a ladle full while the liquid is still spinning and pour into the sample bottle. Repeat these steps until the sample bottle is three quarters full.

Sampling Liquid Manure during Land Application with Irrigation Systems
Place plastic buckets randomly at different distances from the sprinkler head in the field to collect the liquid manure that is being applied by an irrigation system. Immediately after manure has been applied, collect manure from the buckets and combine them into one container. Stir the collective sample, remove a ladle full while the liquid is still spinning and pour into the sample bottle.

Pre-Sampling Nitrogen and Potassium from Liquid Manure Systems
If liquid systems cannot be agitated prior to application and a sample is needed to estimate application rates, manure samples can be dipped off the top of the stored liquid manure to analyze for N and K concentrations. Research indicates that the top-dipped liquid represents approximately 90 percent of the N concentration measured in mixed, field-collected samples. Multiply the results of the N concentration from top-dipped samples by 1.1 for a better estimate of N. Dipping a sample from the surface of a liquid storage pit does NOT provide a good estimate of P concentrations in the pit, so use of the P analysis from top-dipped samples is not recommended. Therefore, if application is limited to a P-based application rate, pre-sampling is not recommended. Producers who take these types of samples should remember to take additional samples during application to calculate the actual amount of nutrients applied and use to adjust commercial fertilizer application. *(Rieck-Hinz, 2003)*

Sampling Dry or Solid Manure
Solid manure systems will include fecal matter, urine, bedding and feed. They can vary from one location to another within the same production operation and from season to season. Sampling of dry or solid manure is best done in the field during application, because it will take into account losses that occur during handling and application. Manure is better mixed during application than during storage. Results will not be available in time to adjust application rates; however, sampling will allow producers to adjust any future commercial fertilizer rates and manure application in subsequent years. If a sample must be taken prior to application to estimate application rates, be sure to take samples from various places in the manure pile, stack or litter to obtain a representative sample for analysis. It may even be beneficial to take samples several times during the year because of the variation in bedding content.

Methods of Sampling:
As with liquid or semi-solid systems, many different methods can be used to obtain a representative sample. The method chosen will depend on the type of solid system used on the farm. Sub-samples can be taken with a shovel, pitchfork or soil probe. Regardless of the method of sampling, a composite

sample will need to be taken from all of the samples to ensure it represents the entire manure used for application. To obtain a composite sample, place all sub-samples (the more sub-samples, the more accurate the results) in a pile and mix with a shovel by continuously scooping from the outside of the pile to the center of the pile until well mixed. Fill a one-gallon plastic Zip-lock® freezer bag (or the bag provided by the laboratory) one-half full with the composite sample by turning the bag inside out over one hand. With the covered hand, grab representative handfuls of manure and turn the freezer bag right side out over the sample with the free hand. Squeeze out the excess air, close, seal and store sample in another plastic sealable bag in the freezer until mailed. *(Rieck-Hinz, 2003)*

1. *Sampling poultry litter in-house:* Collect 10 to 15 sub-samples from throughout the house to the depth the litter will be removed. Cake litter samples should be taken at the depth of cake removal. The number of samples taken near feeders or waterers should be proportionate to their space occupied in the whole house. *(LPES)*
2. *Sampling stockpiled manure, litter or compost:* Ideally, stockpiled material should be stored under cover on an impervious surface. The exterior of uncovered waste may not accurately represent the majority of the material because rainfall moves water-soluble nutrients down into the pile. If an uncovered stockpile is used over an extended period of time, it should be sampled before each application. Take 10 sub-samples from different locations around the pile at least 18 inches below the surface. *(LPES)*
3. *Sampling from a bedded pack:* It is recommended that samples from a bedded pack be taken during loading. Take at least five sub-samples while loading several spreader loads. *(Peters, 2003)*
4. *Sampling daily hauls:* Place a five-gallon pail under the barn cleaner 4 to 5 times while loading a spreader. *(Peters, 2003)*
5. *Sampling scrape-and-haul feedlots:* Facilities where manure accumulates on paved feedlots and is scraped and hauled to the field daily or several times during the week are referred to as scrape-and-haul feedlots. Sub-samples can be collected by scraping a shovel across approximately 25 feet of the paved feedlot. This process should be repeated 10 or more times, taking care to sample in a direction that slices through the variations of moisture, bedding, depth, age, etc. Avoid excessively wet areas and areas with large amounts of hay or feed. Several composite samples may be needed for this type of facility. *(Rieck-Hinz, 2003)*
6. *Sampling during spreading or land application:* Spread a sheet of plastic or a tarp in the field and drive the tractor and spreader over the top of the plastic to catch the manure from one pass of the spreader. Samples should be collected to represent the first, middle and last part of the storage facility or loads applied and should be correlated as to which loads are applied on each field to track changes in nutrient content throughout the storage facility. *(Rieck-Hinz, 2003)*

References

Peters, John. (ed.) 2003. **Recommended Methods of Manure Analysis**. University of Wisconsin Extension. A3769.

Rieck-Hinz, A., J. Lorimor, T. Richard, and K. Kohl. 2003. **How to Sample Manure for Nutrient Analysis**. Iowa State University Extension. PM1558.

Chastain, J.P. 2003. **Manure Sampling Procedures.** South Carolina Confined Animal Manure Managers Certification Program. Clemson Extension.

Livestock and Poultry Environmental Stewardship (LPES) Curriculum. Manure Sampling. Module D. Land Application and Nutrient Management.

(Rule 1200-04-05-.14, continued)

Appendix A

Agreement for the Removal of Litter, Manure and/or Process Wastewater from an AFO

The conditions listed below help to protect water quality. These conditions apply to litter, manure and/or process wastewater removed from an AFO. The material covered by this agreement was removed on _____ from the facility owned by _____ located at _____.

A. The litter, manure and/or process wastewater must be managed to ensure there is no discharge of litter, manure and/or process wastewater to surface or groundwater.

B. When removed from the facility, litter, manure and/or process wastewater should be applied directly to the field or stockpiled and covered with plastic or stored in a building.

C. Litter, manure and/or process wastewater must not be stockpiled near streams, sinkholes, wetlands or wells.

D. Fields receiving litter, manure and/or process wastewater should be soil tested at least every two or three years.

E. A litter, manure and/or process wastewater nutrient analysis should be used to determine application rates for various crops.

F. Calibrate spreading equipment and apply litter, manure and/or process wastewater uniformly.

G. Apply no more nitrogen or phosphorus than can be used by the crop (i.e., agronomic rates).

H. A buffer zone is recommended between the application sites and adjacent streams, lakes, ponds, sinkholes and wells.

I. Do not apply litter, manure and/or process wastewater when the ground is frozen or on steep slopes subject to flooding, erosion or rapid runoff.

J. Cover vehicles hauling litter, manure and/or process wastewater on public roads.

K. Keep records of locations where litter, manure and/or process wastewater will be used as a fertilizer.

I, _____ (name) am the person receiving litter and do understand the conditions listed above.

_____ (signature) _____ (date)

_____ (address) _____ (phone)

(Rule 1200-04-05-.14, continued)

Appendix B

Names of Persons and/or Firms That Remove Litter, Manure and/or Process Wastewater from an AFO

____

(name of AFO)

Name: ____________________ Name: ____________________

Address: ____________________ Address: ____________________

____________________ ____________________

Phone No.: ____________________ Phone No.: ____________________

Tons Removed: ____________________ Tons Removed: ____________________

Date: ____________________ Date: ____________________

Name: ____________________ Name: ____________________

Address: ____________________ Address: ____________________

____________________ ____________________

Phone No.: ____________________ Phone No.: ____________________

Tons Removed: ____________________ Tons Removed: ____________________

Date: ____________________ Date: ____________________

Name: ____________________ Name: ____________________

Address: ____________________ Address: ____________________

____________________ ____________________

Phone No.: ____________________ Phone No.: ____________________

Tons Removed: ____________________ Tons Removed: ____________________

Date: ____________________ Date: ____________________

Name: ____________________ Name: ____________________

Address: ____________________ Address: ____________________

____________________ ____________________

Phone No.: ____________________ Phone No.: ____________________

(Rule 1200-04-05-.14, continued)

Tons Removed:	Tons Removed:
Date:	Date:
Name:	Name:
Address:	Address:
Phone No.:	Phone No.:
Tons Removed:	Tons Removed:
Date:	Date:

Authority: *T.C.A. §§ 4-5-201 et seq. and 69-3-101 et seq.* ***Administrative History:*** *Original rule filed November 25, 1977; effective December 26, 1977. Amendment filed May 7, 2004; effective July 21, 2004. Amendment filed May 22, 2007; effective August 5, 2007. Repeal and new rule filed March 2, 2011; effective May 31, 2011.*

Closure Plan

In the event that Swine production at this location ceases, the following will be done within 360 days:

- All manure in all animal use areas will be removed and spread on the farm or spread elsewhere according to my current Nutrient Management Plan.
- The most current manure analysis will be provided to anyone removing manure from the farm.
- Any dead pigs on the farm will be disposed of at the time of closure according to methods outlined in my current Nutrient Management Plan and or allowable by Tennessee Law.
- Any manure which is land applied will be done so according to the rates discussed in my most recent Nutrient Management Plan.

The following will be completed within a reasonable period as allowable by law using Tennessee Natural Resources Conservation Service (NRCS) Standard Code 360- Closure of Waste Impoundments:

- Any manure storage facility (lagoon) located on the swine farm will be properly decommissioned.
- Any manure currently in storage at the time of closure will be removed and spread on the farm or spread elsewhere according to my current Nutrient Management Plan.
- The lagoon will be breached and backfilled and or converted to freshwater storage according to NRCS standards.

Date: 10-14-12

Addendum to Nutrient Management Plan:

By my signature below, I affirm that I have read, understand, and will comply with the following stipulations from Tennessee's CAFO rule (1200-4-5-.14) that apply to my CAFO operation.

1) All clean water (including rainfall) is diverted, as appropriate, from the production area.
2) All animals in confinement are prevented from coming in direct contact with waters of the state.
3) All chemicals and other contaminants handled on-site are not disposed of in any manure, litter, process wastewater, or storm water storage or treatment system unless specifically designed to treat such chemicals and other contaminants.
4) All sampling of soil and manure/litter is conducted according to protocols developed by UT Extension.
5) All records outlined in 1200-4-5-.14(16)d-f will be maintained and available on-site.
6) Any confinement buildings, waste/wastewater handling or treatment systems, lagoons, holding ponds, and any other agricultural waste containment/treatment structures constructed after April 13, 2006 are or will be located in accordance with NRCS Conservation Practice Standard 313.
7) Drystacks of manure or stockpiles of litter are always kept covered under roof or tarps.
8) An *Annual Report* will be written for my operation and submitted between January 1 and February 15 of each year. It will include all information required by rule [1200-4-5-.14(16)g].

Signature of CAFO Operator:

Date: 10-14-12

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Waters Agricultural Laboratories, Inc.

Manure/Sludge Analysis and Application Report

*2101 Calhoun Road - Hwy 81 * Owensboro, Kentucky 42301 * phone: (270) 685-4039*

Ship To:	Grower: Tosh Pork	
Tosh Pork 1586 Atlantic Ave. Henry, TN 38231-	SampleNumber: Brevard 1&2 Lab Number: 15044 Type: Manure	Date Submitted: 7/1/2011 Report Date: 7/6/2011

	Parts per million (ppm)	Pounds per 1000 gallons
Nitrogen – Total	2474.8	20.640
Ammonia Nitrogen	2262.8	18.872
Nitrate Nitrogen	14.1	0.118
Organic Nitrogen	197.9	1.650
P2O5 – Total	1025.2	8.550
K2O –Total	2185.1	18.224

Moisture	99.06 %	

Results Reported On: L-LIQUID BASIS

Remarks Suggest the use of PLANT and SOIL analysis to monitor the need for additional and or build up of some elements.

Waters Agricultural Laboratories, Inc.

Manure/Sludge Analysis and Application Report

*2101 Calhoun Road - Hwy 81 * Owensboro, Kentucky 42301 *phone: (270) 685-4039*

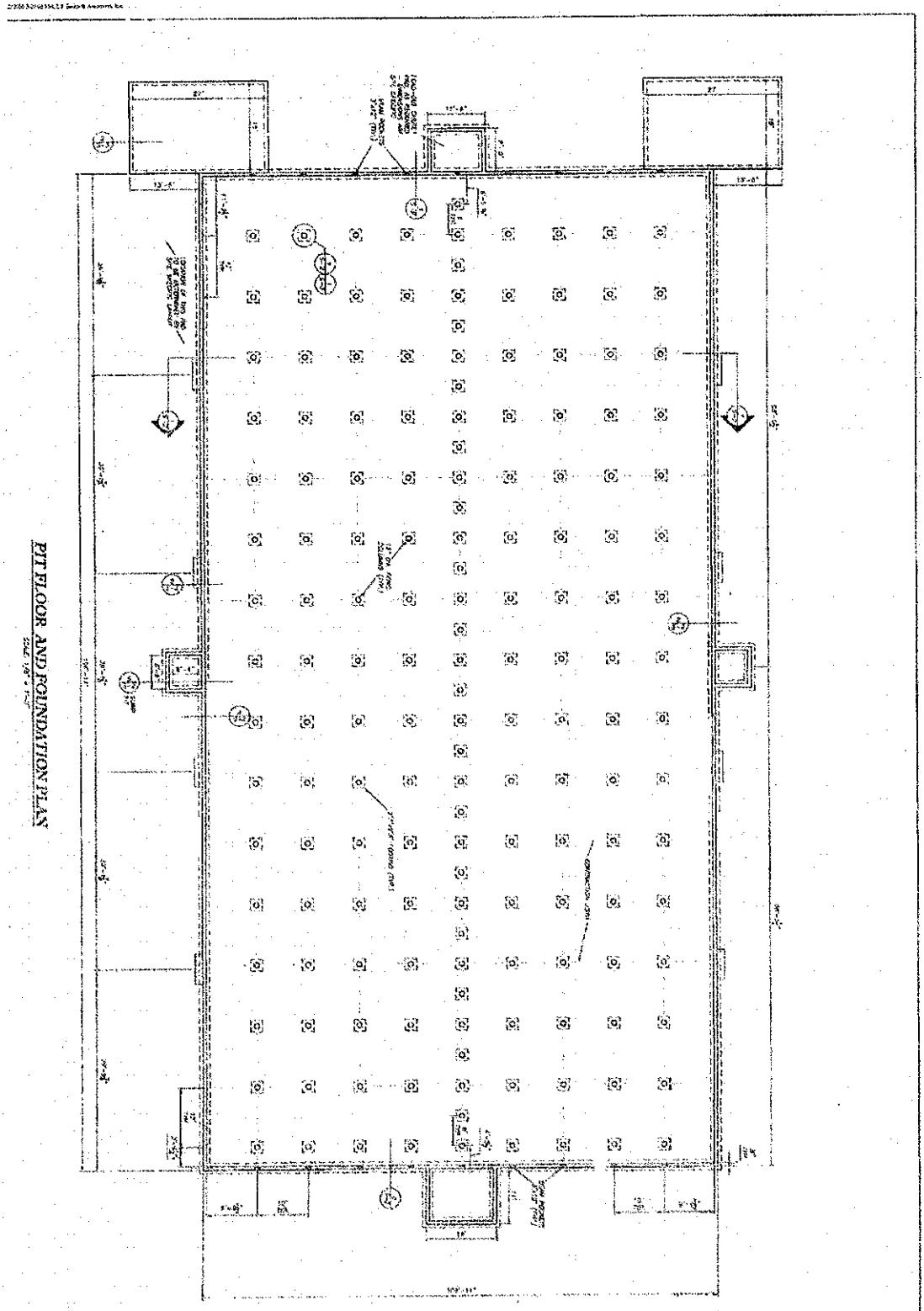
Ship To:	Grower: Tosh Pork	
Tosh Pork 1586 Atlantic Ave. Henry, TN 38231-	SampleNumber: Brevard 3&4 Lab Number: 15045 Type: Manure	Date Submitted: 7/1/2011 Report Date: 7/6/2011

	Parts per million (ppm)	Pounds per 1000 gallons
Nitrogen – Total	2794.4	23.305
Ammonia Nitrogen	2498.8	20.840
Nitrate Nitrogen	16.8	0.140
Organic Nitrogen	278.8	2.325
P2O5 – Total	1425.9	11.892
K2O –Total	2533.2	21.127

Moisture	98.79 %	

Results Reported On: L=LIQUID BASIS

Remarks Suggest the use of PLANT and SOIL analysis to monitor the need for additional and or build up of some elements.



PIT FLOOR AND FOUNDATION PLAN

FOUNDATION PLAN | S-1

L. I. SMITH & ASSOCIATES, INC.
SURVEYORS · ENGINEERS

STANDARD HOG BARN
SITE ADDRESS
CITY, COUNTY, STATE

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